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EXAMINER
GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
1763	6

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10-076,129	Applicant(s) He et al
	Examiner George Goudreau	Group Art Unit 1763

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on (2-02' to 6-02')(ie, papers #1-5),

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-26 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-26 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

Office Action Summary

15. Claims 1-20, 22, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-In claims 1, and 18, the body of the claim does not match the scope of the preamble. (The preamble of these claims recite an etching method while the body of these claims fail to positively recite any etching step.);

-In claims 6, 18, and 26, the term "sulfuric fluoride" should read "sulfur fluoride".;

-In claims 13, and 17, the recitation of two different high frequency sources to generate the plasma is confusing, and should be reworded.;

-The wording used throughout claim 16 is confusing, and should be reworded.;

-In line 3 of claim 22, the phrase " from the group of " should read "from the group consisting of" in order to be proper Markush language.; and

-Claim 26 is redundant upon claim 24 upon which it depends.

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

17. Claims 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshichika et. al. (JP 61-171,127).

Yoshichika et. al. disclose an apparatus for rie etching a semiconductor wafer in parallel plate etcher which is equipped with means for adjusting the ratio of etching of the center of the wafer to the edge of the wafer to reduce micro-loading by regulating the flow of an etching gas from a supply tank, and a coating gas from another supply tank using individually distinct mass flow control means. This is discussed specifically in the abstract; and discussed in general on pages 127-129. This is shown in figures 1-3.

The rie etcher taught above is clearly capable of utilizing each of the specific process gasses which are claimed by the applicant in their apparatus claims. Therefore applicant has failed to distinguish their apparatus claims over this reference by specifically reciting the specific usage of these gasses. The examiner cites the case law listed below of interest to the applicant in this regard.

Furthermore, it is obvious to one skilled in the art that the configuration of the substrate worked upon by the apparatus claimed in this invention is not patentable in view of In re Young (25 U.S.P.Q. 69, 71 (CCPA 1935)) and In re Rishoi (94 U.S.P.Q. 71,73 (CCPA 1952)). The Court of Customs and Patent Appeals stated In re Young that inclusion of material worked upon by a machine as element In claim may not lend patentability since claim is not otherwise allowable. Similarly, the Court of Customs and Patent Appeals stated In In re Rishoi that there is no patentable combination between a device and the material upon which it works.

18. Claims 1-8, 14, 18-19, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda et. al. (12-1996').

Oda et. al. disclose a process for reducing the amount of micro-loading which occurs in an plasma etching process used to etch a Ta layer on a Si wafer during the production of an X-ray mask. They employ a plasma which is comprised of (SF6-CF4) to conduct their etching process. The flow ratio of these gasses is adjusted In order to minimize any observed micro-loading effect in the etching process. This is discussed on pages 4366-4370. This is shown In figures 1-8.

19. Claims 1-8, 12-14, 18-19, and 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Nallan (2002/0132488).

Nallan discloses a process for rie etching a Ta gate layer on a Si wafer In an RF biased inductively coupled plasma etcher which is equipped with means for RF biasing the cathode electrode. The RF power source used to power the induction coil has a frequency of 12.56 MHZ. The RF power source used to power the cathode has a frequency of 13.56. A plasma which is comprised of an inorganic fluorine source such as (NF3 or CF4) plus a CxHyFz gas such as CF4 is used to rie etch the Ta layer. The concentration of the inorganic gas, and the CxHyFz gas are adjusted relative to each other in order to minimize any micro-loading effects observed in the rie etching step. This is discussed on pages 1-5. This is shown In figures 1-2.

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth In this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth In section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill In the art to which said subject matter pertains. Patentability shall not be negatived by the manner In which the invention was made.

21. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made In order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

22. Claims 9-11, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nallan as applied in paragraph 19 above.

Nallan as applied in paragraph 19 above fail to disclose the following aspects of applicant's claimed invention:

-the specific etch process parameters which are claimed by the applicant

It would have been prima facie obvious to employ any of a variety of different etch process parameters In the etching process taught above including those which are specifically claimed by the applicant. These are all well known variables in the plasma etching art which are known to effect both the rate and quality of the plasma etching process. Further, the selection of

particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific process condition which are claimed by the applicant In the etching process taught above based upon In re Aller as cited below.

"Where the general conditions of a claim are disclosed In the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process conditions which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the plasma etching process.

23. Claims 9-13, 16-17, 20, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et. al. as applied in paragraph 18 above.

Oda et. al. as applied In paragraph 18 above fail to disclose the following aspects of applicant's claimed invention:

-the specific etch process parameters which are claimed by the applicant; and

-the specific usage of the type of etching apparatus which is claimed by the applicant

It would have been obvious to one skilled in the art to employ the specific type of etching apparatus which is claimed by the applicant to conduct the plasma etching process which is taught above based upon the following. The usage of the type of etching apparatus which is claimed by

the applicant is conventional or at least well known in the etching arts. (The examiner takes official notice in this regard.) Further, the specific usage of the type of plasma etching apparatus which is claimed by the applicant to conduct the plasma etching process taught above simply represents the usage of an alternative, and at least equivalent means for conducting the plasma etching process taught above to those means which are specifically taught above.

It would have been prima facie obvious to employ any of a variety of different etch process parameters in the etching process taught above including those which are specifically claimed by the applicant. These are all well known variables in the plasma etching art which are known to effect both the rate and quality of the plasma etching process. Further, the selection of particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific process condition which are claimed by the applicant In the etching process taught above based upon In re Aller as cited above.

Further, all of the specific process conditions which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the plasma etching process.

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (703) -308-1915. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) -306-3186.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.

George A. Goudreau/gag

Primary Examiner

AU 1763